

professus est. Rerum Naturae quidem studiosis non ignotum est electrometron illud ab eodem inventum. Etiam plurimum oculis obversatae sunt imagines illae pulcherrimae in quibus lucis auxilio et colores varii et luminis ipsius spectrum (ut aiunt) accuratissime redduntur. Peritoribus autem nota sunt volumina, quae ab eo et audiendi et videndi rationi universae explicandae dedicata sunt, quae et vim caloris et vim electricam modulosque eius ordine lucido enuclearunt. In his modulis sollertissime metiendis, iuvat recordari Cancellarii nostri cum rationibus hospitis nostri hodierni rationes minutissime quadrare. Ceterum de re tam subtili non nostrum est hodie fusius disputare; oratoris vestri ex animo nondum excidit monitum illud Horatianum:—

“metiri se quemque suo modulo ac pede verum est.”

Praesento vobis Francogallorum Instituti socium illustrem, GABRIELEM LIPPMANN.

(3) Etiam e republica maxima trans aequor Atlanticum, nobis coniunctissima, ad nos advectus est vir insignis, Washingtonii in urbe illustri mensurae et ponderis provinciae praepositus, qui pecuniae publicae summam ingentem sibi liberaliter creditam, et scientiae ipsius et populi industrii maximo cum fructu, his rebus omnibus ad normam accuratam redigendis dedicavit; qui quantum operariorum industriae scientiarum exquisita cognitio conferat, luculenter demonstravit. Non inter antiquos tantum sed etiam nostro in saeculo trans aequor Atlanticum cognitum est, Mercurio, Atlantis nepoti, negotiariorum omnium numini, Divam Minervam, scientiarum omnium reginam, sororem esse omnium dignissimam. Animi nostri fraterni in testimonium, eo libentius hodie salutamus virum eloquentem, quem etiam ipsum Atlantis nepotem facundum nominaverim, SAMUELEM WESLEY STRATTON.

(4) Olim Altonae natus, a Berolinensibus educatus et ab eisdem scientiae physicae ad cathedram revocatus, adest sonitus in aëre clausi velocitatis investigator clarissimus, qui itineris sui inter comites insigniores etiam Cancellarium nostrum numeravit. Idem rei magneticae phaenomena illa perquam impedita expedit, quae Professor quidam noster postea *Hysteresis* nomine nuncupavit. Denique scientiae physicae Imperii totius Germanici Instituto celeberrimo praepositus, virorum magnorum successor magnus merito esse existimatur. Inter Doctores nostros honoris causa olim HELMHOLTZII numeravimus: hodie successorem eius recentissimum ordini eidem libenter addimus.

Doctorem nostrorum seriem claudit hodie scientiae physicae honoris causa Professor Berolinensis, AEMILIUS WARBURG.

A large number of specimens of timber, grown, many under forestry conditions, on the Brocklesby Estate, Lincolnshire, has recently been sent by Lord Yarborough to the forestry museum, which is temporarily housed in the botany school. No fewer than seventy-seven species of trees are represented in this donation. Although forestry, as a subject of instruction at Cambridge, only dates from October, 1907, the collection of timbers already acquired is considerable, and includes both home-grown and foreign specimens, some of which are extremely rare, as that of the Servian spruce, an almost extinct species, which is confined to the valley of the Drina, between Servia and Bosnia.

The Gedge prize has been awarded to E. Mellanby, of Emmanuel College, for his essay entitled “Creatin and Creatinin.”

Prof. Pope announces a valuable gift of apparatus and chemicals which has been made to the university chemical laboratory by the master and fellows of Gonville and Caius College and the master and fellows of Sidney Sussex College upon the closing of the chemical laboratories in the two colleges.

A CONFERENCE of fruit-growers will be held at the South-Eastern Agricultural College, Wye, Kent, on November 27, under the chairmanship of Mr. C. W. Radcliffe Cooke, president of the National Association of English Cider-makers. Insecticides will be discussed by Mr. Spencer Pickering, F.R.S., spraying and spraying machinery by Mr. E. S. Salmon, grading and packing by a representative from British Columbia.

SOME two years ago the governors of the Sir John Cass Institute decided, in view of the great importance of the fermentation industries and the fact that there was very little methodical instruction available in London for those who were occupied in breweries and distilleries, to institute a course upon the chemistry of fermentation, and they appointed Mr. Arthur R. Ling to conduct this course. They have now broadened the basis of the work; and over and above the laboratory course in brewing and malting Dr. A. Harden will, during the winter, give a course of instruction in the micro-biology of the fermentation industries, which will consist of lectures and demonstrations. The first of this course was delivered on October 6, when Dr. Horace Brown, F.R.S., occupied the chair. In his opening remarks the chairman alluded to the value of scientific research, and said that there appears to be a considerable amount of misconception in the lay mind as to the meaning of the treatment of scientific research, and perhaps a still greater misconception in the methods employed in furthering it. The popular belief at present in vogue is that the scientific worker, in the first place, looks round for some great problem which calls for solution, and then proceeds by a series of experiments of trial and error to cut deep into the heart of the subject. Occasionally this method, if carried out, may lead to results, but he would rather suggest that research consists in finding some loose thread in the frayed edge of a piece of embroidery and in patiently following up the slender clue wheresoever it may lead, thus gradually revealing the elaborate pattern and the manner in which it is interwoven. Dr. Harden in his lecture first traced the history of the progress of knowledge with regard to alcoholic fermentation, referring to the work of Lavoisier, Liebig, Pasteur, and Buchner. Working with Mr. Young at the Lister Institute, he found that phosphates gradually increase the rate of fermentation, a definite chemical reaction taking place in which the amount of carbonic acid exactly equivalent to the phosphate added is evolved, the phosphate itself entering into combination with the second molecule of sugar. Finally, a short account was given of recent work on the fermenting complex present in yeast-juice. Dr. Harden and Mr. Young consider this to consist of two distinct substances—the enzyme and co-enzyme—the cooperation of which is necessary to produce fermentation when added to a solution of sugar and a phosphate.

## SOCIETIES AND ACADEMIES.

### LONDON.

**Royal Society, June 4.**—“Note on a New Sounding Machine for use on Lakes and Rivers without a Boat. By Prof. E. J. Garwood. Communicated by Prof. T. G. Bonney, F.R.S.”

The sounding machine was designed specially for use on mountain lakes and rivers where boats cannot be obtained, but it can also be used with a boat, in which case it has the advantage over the sounding machines usually employed, since it registers the position as well as the depth of each sounding.

The instrument consists of two posts which are erected on opposite sides of a lake or river; between them a line is stretched, the ends of which are wound on drums carried by the posts. By alternately winding this line on each post a float is drawn backwards and forwards across the lake, the position of the float at any moment being automatically registered on the post worked by the observer. The float carries a pulley over which the plummet line travels, the end of this line being wound on a second drum attached to the observer's post. In this way rows of soundings can be taken across the lake, one of the posts being moved each time that the float reaches the shore until the whole lake has been charted.

By a mechanical device one counting machine is made to register both the depth of each sounding and the distance from the shore at which it is taken; it is also engraved with a double set of figures counting in opposite directions, so that observations can be taken in whichever direction the float is travelling. The instrument is supplied with a check and also a stop brake, and mechanical devices are provided to insure the constant tension of the line, and for preventing unequal piling of the line on the two drums.

There is also a special lever, by means of which the counting discs can be disengaged and returned rapidly to zero, the lines meanwhile remaining at rest. An important point in the practical working of the instrument is the fact that all mechanism is confined to the observer's post, so that any unskilled assistant can be utilised.

The instrument is portable, and can be carried by one man even in mountainous districts.

June 18.—“The Giant Nerve Cells and Fibres of *Halla parthenopeia*.” By Dr. J. H. Ashworth. Communicated by Prof. J. C. Ewart, F.R.S.

An anterior and a posterior series of giant cells are present in *Halla*; the following statement refers to the anterior series. Primary giant cells are formed in segmental couples—one couple in each of the anterior ganglia of the nerve cord—until a maximum of eight couples is attained. Secondary giant cells are also formed at the anterior end of the nerve cord, and occasionally in one or more ganglia already possessing a primary couple. There is a progressive increase in the size of the primary giant cells until the worm has attained a length of 30 cm. to 40 cm. Yellow granules, probably insoluble products of metabolism, are present in the giant cells. Chromophilous granules occur in great abundance in a specialised perinuclear zone, distinguishable in the living cell by its greater refringency.

The neurofibrillar network in the giant cell is divisible into a peri-nuclear network, situated at the margin of the peri-nuclear zone, and a more extensive, wider meshed, and generally more slender stranded network in the general protoplasm. From this network slender primitive fibrils pass into the cone of origin of the axone, whence stouter fibrils, each due to the fusion of several primitive fibrils, pass into the giant fibre. The bundle of neurofibrillæ occupies from one-fourth to three-fourths of the internal diameter of the giant fibre.

The anterior giant cells of *Agaurides fulgida* agree in the main features of their arrangement and structure with those of *Halla*.

Entomological Society, October 7.—Mr. C. O. Waterhouse, president, in the chair.—*Exhibits*.—W. G. Sheldon: Butterflies from Andalusia taken in the spring of this year. They included *Anthocharis belemia* and var. *glauce*; *A. tagis*, low-level and high-level forms; *Zegris eupheme*, var. *meridionalis*; *Melitaea phoebe*, var. *occitanica*; *M. deione*, a very large and well-marked form; and *Melanargia ines* with one striking aberration showing a strong melanic tendency.—Dr. Herbert Charles: Remarkable aberration of *Dryas paphia*, taken in the New Forest in July. With the exception of the borders and the bars, all the upper sides of the wings were suffused with deep velvety-brown triangular patches, the maculations being entirely absorbed therein.—Hugh Main: living larvæ of *Blatta germanica* to illustrate their colourless condition on first emergence.—H. St. J. Donisthorpe: Examples of (a) *Agrilus biguttatus*, F., from Sherwood Forest, not taken in Britain for about thirty years; (b) *Pyropterus affinis*, not uncommon in Sherwood Forest, July; (c) a species of *Phora*, with pupæ bred from larvæ which came out of the body of a *Clerus formicarius* taken alive in Sherwood Forest, July, with the *Agrilus*, and probably parasitic on it; (d) *Trogolinus anglicanus*, Shp., a specimen taken at Bembridge, August 3, with a specimen from Plymouth, only known before to occur in New Zealand and at Plymouth; (e) *Phyto melanoccephala*, Mg., bred from wood-lice taken at Bembridge, Isle of Wight, August, with pupæ, and a wood-louse with dipterous pupa *in situ*. The life-history of the fly was hitherto unknown, though the larvæ of *Rhinophora atramentaria*, Mg., a nearly related species, have been recorded as parasitic on *Oniscus asellus*.—A. Harrison: A gynandromorphous example of *Pieris napi*, bred from parents taken in north Cornwall this year.—E. R. Speyer: Rare and interesting dragon-flies taken in the British Isles in 1908, including *Sympetrum fonscolombii*, Selys, ♂ and ♀, taken in Hertfordshire on June 24 and July 27 respectively; *Somatochlora metallica*, Lind., a ♂ captured in Sussex on August 4, being the first authentic record of this insect in England; and *Libellula quadrimaculata*, Linn., four specimens, showing the remarkable

difference in the amount of suffusion on the wings in individuals.—Norman Joy: Examples of Coleoptera new to the British list.—H. M. Edelen: Specimens of *Aeschna isosceles* and *Libellula fulva* from Norfolk Broads, taken in June, and *Orthetrum caeruleum* from Chagford, taken in July.—W. J. Lucas: A spike of the grass *Molinia caerulea* with dead Syrphids, *Melanostoma scalare*, Fabr., attacked by the parasitic fungus *Empusa muscae*, found on Esher Common, October 3. Many or most were attached by the point of the head only in a very peculiar manner, and apparently all were females.—O. E. Janson: A specimen of *Cryptamorpha desjardinsi*, Guér., found by Mr. F. C. Selous at Barton-on-Sea, Hants. This beetle is recorded as living on banana plants in Mauritius and Madeira, and may have been introduced here in the banana fruit.—W. West: Specimens of the following insects:—*Aleochara crassiuscula*, Sahlb., taken at Great Yarmouth in May; varieties of *Donacia dentipes* and *D. simplex*, from Caistor Marshes; *Nabis boops*, Schödté, taken at Esher in August; and *Idiocerus scurra*, Germ., taken at Blackheath, Kent, in September.—L. W. Newman: Specimens of (a) *Crymodes exilis* from the Shetlands, including one of the very rare female; (b) *Callimorpha dominula*, two yellow aberrations bred from east Kent ova; and (c) a varied series of *Campptogramma fluviala*.—Dr. F. A. Dixey: A number of Central and South American butterflies belonging to six different sub-families, but all showing the same obvious character of a diagonal reddish band on a general dark surface.—*Papers*.—Bionomics of butterflies: Dr. G. B. Longstaff.—Some additions to the Perlidae, Neuroptera-Planipennia, and Trichoptera of New Zealand: L. J. Hare.—The larvæ of *Hamanumida daedalus*, Fab., *Hoplitis phyllocampa*, n.sp., and *Sulophonotus myrmeleon*, Feld, with descriptions of the imagines of the two Heterocera: Roland Trimen.—Revision of the Australian and Tasmanian Malaco-dermidæ: A. M. Lea.

Institution of Mining and Metallurgy, October 15.—Mr. Alfred James, president, in the chair.—The separation of metallic ores by jiggging: A. Taylor. A description of a modification of the ordinary mechanical jig, devised by the author, in which a vibrator is substituted for the usual plunger. The vibrator consists of a shaft provided with discs or fly-wheels so constructed that their centres of gravity do not coincide with that of the shaft to which the hutch is attached; consequently the revolution of the shaft and hutch carrying the screen, in accordance with the law which compels a rapidly revolving mass to rotate around its centre of gravity when uncontrolled by fixed bearings. In this case the whole apparatus is hung on springs, allowing of free vibration in any direction. The paper contains also a description of the ores for the special treatment of which the apparatus was primarily designed.—Laboratory routine in modern smelters: H. T. Waller. A brief description of methods found useful by the author in connection with copper blast-furnace smelting. These include the analyses of slags and matte, and determinations of copper, iron, silica, lime, aluminium oxide, zinc, and sulphur.—Reinforced concrete foundations for stamp batteries: S. J. Truscott and J. P. Fuller. A detailed account of the replacement of the original wooden mortar blocks of the stamp battery at Redjang Lebong, Sumatra, by others constructed of reinforced concrete, with notes on the composition of the materials used and the cost of the work.—The estimation of sulpho- and ferrocyanides, &c., in cyanide solutions containing copper: L. M. Green. This paper deals with the complications arising from the presence of copper in solutions obtained in the cyanide treatment of silver and gold ores in regard to the determination of sulpho- and ferrocyanides. Cupric and cuprous double cyanides exercise a reducing action on permanganate in acid solution, and precipitate both sulpho- and ferrocyanides, so that an ordinary method of determination is often impossible. The paper describes some of the reactions and tests to be adopted in these circumstances.—Mine sampling devices: H. E. Hooper. Two devices, a hanging sampling chair for use in winzes, and a catching bag for employment in conjunction with the chair, are here briefly described and illustrated.



## PARIS.

**Academy of Sciences, October 12.**—M. Bouchard in the chair.—A statement of the conditions under which the Bonaparte fund will be applied.—The application to man of an anti-tuberculous serum: MM. **Lannelongue, Achard, and Gaillard.** The serum is prepared from horses and asses, after submitting the animals to the action of a toxin extracted from the tubercle bacillus. Preliminary experiments on animals appeared to show some beneficial effects, and an account is now given of the treatment of human tuberculous subjects with this serum. The experiments have lasted more than a year, more than fifty subjects affected with various tuberculous diseases having submitted to the treatment. The serum is well tolerated, and can be used without danger; it is without curative influence on cases of advanced tuberculosis, but in less advanced cases forms a useful addition to the usual therapeutic treatment. In some cases the number of tubercle bacilli was shown to diminish and even disappear.—Cultural bud mutations in *Solanum Maglia*: Edouard **Heckel.** This variety offers certain advantages over *Solanum tuberosum* in its resistance to mildew, does not require a soil specially resistant to drought, and accommodates itself to soils containing large amounts of clay and lime.—The Tempel-Swift comet: MM. **Javelle and Giacobini.** Observations of the comet were made at Nice on the nights of September 29, 30, and October 2 and 3. The mean positions of the comparison stars and the apparent positions of the comet are given.—Remarks on a note of M. Lebedew relating to the dispersion of light in interstellar space: Charles **Nordmann.**—Systems of families of surfaces cutting along conjugate lines: S. **Carrus.**—The extraction of the rare gases of the atmosphere: Georges **Claude.** A description, with diagram, of a modification of the commercial apparatus for separating oxygen and nitrogen by fractional distillation for the purpose of extracting the lighter gases of the atmosphere. The modified apparatus gives a continuous flow of a gaseous mixture consisting of nitrogen with at least 50 per cent. of neon, helium, and hydrogen. Another modification gave a gas with a density of 0.68 that of air; since the density of neon is 0.69, the gas thus obtained is extremely rich in neon. Approximately pure neon can in this way be obtained in any quantity.—Researches on the diffusion of gaseous ions: Edouard **Salles.**—The method of calculation of the atomic weights: Louis **Dubreuil.** A discussion and modification of the methods of Hinrichs.—One of the causes modifying the dominant forms in crystals, and on solid solutions: Paul **Gaubert.** It is shown that in the crystallisation of phthalic acid the addition of small quantities of liquids to the solvent causes modifications in the form of the crystals separating on cooling. It is known that a crystal, growing in a liquid, can absorb molecules of another crystalline substance, and to this must now be added the molecules of the solvent itself or of another liquid present in the solvent.—Katafa, Geaya, and Macrocalyx, three new Madagascan plants: M. **Costantin** and H. **Poisson.**—The skeleton of the anterior member of *Bradydus torquatus*: A. **Menegaux.**—The phenomena of phagocytosis and autodigestion in the course of the regression of the ascidizoids in the Diplosomideae (compound ascidians): Antoine **Pizon.**—Crossing in the Amphibia from the cytological point of view: E. **Bataillon.**—Anatomical orientation in radiography: A. **Rieffel** and Maxime **Ménard.** The incorrect placing of the Crookes's tube may result in apparent displacements, deformations, or lesions, or, conversely, may mask these if present.—Contribution to the study of audition: M. **Marage.** A comparison of the theory of Helmholtz and that according to which all the nerve centres are equally impressed; the latter theory is held to correspond most closely with the most recent anatomical and pathological knowledge.—The resistance at 100° C. of the hæmolysins of prepared serums. The separation of alexine and its sensitiser by filtration through collodion: Albert **Frouin.**—The treatment of trypanosomiasis in horses by orpiment alone or associated with atoxyl: A. **Thiroux** and L. **Teppaz.** *T. casabouvi* and *T. dimorphon* have been successfully treated by the combination of orpiment with atoxyl, all the three horses treated being cured. It is

possible that m'bori is also curable by this treatment. Two horses suffering from souma have been treated with success by orpiment alone.—The persistence throughout Corsica of a zone of abnormal contacts between the eastern and western region: M. **Deprat.**—Disturbances in the electric charge of the earth: Albert **Nodon.**—Variations of latitude and earthquakes: M. de Montessus **de Ballore.**

## DIARY OF SOCIETIES.

THURSDAY, OCTOBER 22.

CHEMICAL SOCIETY, at 8.30.—The Passage of Hydrogen through a Palladium Septum, and the Pressure which it produces: D. Tsakalotos.—The Relationship of Colour and Fluorescence to Constitution, Part ii., Rhodamines of Mellitic Acid: O. Silberrad and C. S. Roy.—Constitution of the Fluorescences of Mellitic and Pyromellitic Acid: O. Silberrad.—A New Form of Gas Burette: A. E. Hill.—A Molecular Compound of Trinitroacetaminophenol and  $\beta$ -Naphthol: R. Meldola and J. G. Hay.—Reduction Products of Azoxybenzene, Preliminary Notice: L. H. Berry.—Constitution of the Salts of the Phthaleins, and the Cause of Colour in the Triphenylmethane Series: A. G. Green.—Chlorination of  $\beta$ -Nitraniline: B. Flörschheim.—Relation between Absorption Spectra and Chemical Constitution, Part x., Unsaturated Acids of the Benzene Series: E. C. C. Baly and K. Schaefer.—Condensations with Monochloromethyl Ether, Part i., Condensation of Monochloromethyl Ether with Ethyl Malonate and Ethyl Isopropyl Malonate: J. L. Simonsen.—Relation between Chemical Constitution and Physiological Action in Certain Substituted Aminoalkyl-esters: F. L. Pyman.—Effect of Constitution on the Optical Rotatory Power of Optically Active Nitrogen Compounds, Part iii.: R. W. Everatt and H. O. Jones.

FRIDAY, OCTOBER 23.

PHYSICAL SOCIETY (National Physical Laboratory), at 3.30.—Demonstrations of Work in Progress in the Laboratory.

WEDNESDAY, OCTOBER 28.

SOCIETY OF DYERS AND COLOURISTS, at 8. Some Recent Improvements in Dyeing and Cleaning: F. J. Farrell.  
BRITISH ASTRONOMICAL ASSOCIATION, at 5.—Annual Meeting.

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